What is claimed is:

1.   A magnetic disk apparatus including:

a read gate generation unit which generates

5   a read gate signal having a predefined read start

time and read end time that are set using a sector

pulse as a reference; and

a data demodulation unit which reproduces

read data from a medium readout signal by

10   executing a read based on the read gate signal,

the magnetic disk apparatus comprising:

a read gate optimization unit which detects

errors of read data demodulated by the data

demodulation unit while varying the read start

15   time and the read end time of the read gate signal,

the read gate optimization unit determining the

read start time and the read end time at which the

detected errors are minimized and setting the

determined read start and end times in the read

20   gate generation unit.

2.   The magnetic disk apparatus according to

claim 1, wherein

the read gate optimization unit includes:

25   a timing adjustment unit which varies the

read start time and the read end time of the read

gate signal for output to the data demodulation

unit, for each of plural times of executions of test read;

an error detection unit which detects errors of the read data demodulated by the data

5   demodulation unit, for each execution of test read, based on the read gate signal output from the timing adjustment unit; and

an optimum time determination unit which determines as optimum times the read start time

10   and the read end time of the read gate signal at which the errors are minimized of a plurality of errors detected by the error detection unit, the optimum time determination unit setting the determined optimum times in the read gate

15   generation unit.

3.   The magnetic disk apparatus according to claim 2, wherein

the timing adjustment unit varies the read

20   start time and the read end time of the read gate signal individually, and wherein

the optimum time determination unit individually determines the read start time and the read end time at which the errors detected by

25   the error detection unit are minimized, for setting in the read gate generation unit.

4.   The magnetic disk apparatus according to
claim 2, wherein

    the timing adjustment unit varies the read
start time and the read end time backward and
5 forward around a default value in a predefined
time unit.

5.   The magnetic disk apparatus according to
claim 2, wherein
10   the timing adjustment unit varies the read
start time and the read end time backward and
forward around a default value in a read data one
byte time unit.

15 6.   The magnetic disk apparatus according to
claim 2, wherein
    the error detection unit detects as the read
data errors Viterbi metric margins of a Viterbi
determination unit disposed in the data
20 demodulation unit, and wherein
    the optimum time determination unit
determines the read start time and the read end
time at which the detected Viterbi metric margins
are maximized, for setting in the read gate
25 generation unit.

7.   The magnetic disk apparatus according to

claim 1, wherein

the error detection unit detects an error rate of the read data demodulated by the data demodulation unit, and wherein

5   the optimum time determination unit determines the read start time and the read end time at which the detected error rate is minimized, for setting in the read gate generation unit.

10   8.   The magnetic disk apparatus according to claim 1, wherein

the read gate optimization unit is operated at the time of power-on start.

15   9.   The magnetic disk apparatus according to claim 1, wherein

the read gate optimization unit is operated in accordance with a predefined time schedule.

20   10.   The magnetic disk apparatus according to claim 1, wherein

the read gate optimization unit is operated when a change is detected in environmental conditions such as a temperature inside the

25   apparatus.

11.   The magnetic disk apparatus according to

claim 1, wherein

when a plurality of readout heads are disposed, the read gate optimization unit is operated on a head-to-head basis.

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12. The magnetic disk apparatus according to claim 1, wherein

when the medium is divided into zones, the read gate optimization unit is operated on a

10 zone-to-zone basis.

13. A read gate optimization method for a magnetic disk apparatus including a read gate generation unit which generates a read gate signal

15 having a predefined read start time and read end time that are set using a sector pulse as a reference, and a data demodulation unit which reproduces read data from a medium readout signal by executing a read based on the read gate signal,

20 the method comprising:

a timing adjustment step varying the read start time and the read end time of the read gate signal for output to the data demodulation unit, for each of plural times of executions of test

25 read;

an error detection step detecting errors of the read data d modulated in the data demodulation

unit, for each execution of test read, based on the read gate signal output in the timing adjustment step; and

an optimum time determination step

5 determining as optimum times the read start time and the read end time of the read gate signal at which the errors are minimized of a plurality of errors detected in the error detection step, and setting the determined optimum times in the read

10 gate generation unit.

14. The read gate optimization method for a magnetic disk apparatus according to claim 13, wherein

15 the timing adjustment step includes varying individually the read start time and the read end time of the read gate signal.

15. The read gate optimization method for a

20 magnetic disk apparatus according to claim 13, wherein

the timing adjustment step includes varying the read start time and the read end time backward and forward around a default value in a predefined

25 time unit.

16. The read gate optimization method for a

magnetic disk apparatus according to claim 13, wherein

the timing adjustment step includes varying the read start time and the read end time backward

5   and forward around a default value in a read data one byte time unit, for detection of errors.

17.   The read gate optimization method for a magnetic disk apparatus according to claim 13,

10   wherein

the error detection step includes detecting as the read data errors Viterbi metric margins of a Viterbi determination unit disposed in the data demodulation unit, and wherein

15   the optimum time determination step includes determining the read start time and the read end time at which the detected Viterbi metric margins are maximized, and setting the determined times in the read gate generation unit.

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18.   The read gate optimization method for a magnetic disk apparatus according to claim 13, wherein

the error detection step includes detecting

25   an error rate of the read data demodulated by the data demodulation unit, and wherein

the optimum time determination step

includes determining the read start time and the

read end time at which the detected error rate is

minimized are determined, and setting the

determined times in the read gate generation unit.

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19.   A program operable to cause a computer to

execute:

the computer being incorporated in a

magnetic disk apparatus including a read gate

10   generation unit which generates a read gate signal

having a predefined read start time and read end

time that are set using a sector pulse as a

reference, and a data demodulation unit which

reproduces read data from a medium readout signal

15   by executing a read based on the read gate signal,

a timing adjustment step varying the read

start time and the read end time of the read gate

signal for output to the data demodulation unit,

for each of plural times of executions of test

20   read;

an error detection step detecting errors of

the read data demodulated in the data demodulation

unit, for each execution of test read, based on

the read gate signal output in the timing

25   adjustment step; and

an optimum time determination step

determining as optimum times the read start time

and the read end time of the read gate signal at which the errors are minimized of a plurality of errors detected in the error detection step, and setting the determined optimum times in the read

5   gate generation unit.